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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,811	OTTERMANN ET AL.	
	Examiner	Art Unit	
	Tracie Green	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/10/2006, 07/26/2007,03/17/2008*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 6 is objected to because of the following informalities: claims 4 and 6 recite the exact same limitations, and both depend from 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 1-6, 25, and 41 include a limitation which recites "one of (i).... and (ii) at most..." Examiner is unclear as to whether the applicant is claiming (i) , (ii) or both limitations. Claims 7-24, 26-40 and 42 are rejected based on their dependency status on claims 1-6, 25 and 41 respectively. For purposes of examination, the examiner will assume the applicant would prefer either one of the limitations recited in the claims.

5. Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically claim 39 contains "carried out with one of (i).....

and (iv) by means of Sol-gel coating, immersion, spray or centrifugal coating." It is unclear to the examiner if the applicant is claiming two processes or one. For purposes of examination, the examiner will assume either one will satisfy the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-13, 15-16, 25-28, 33, 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647).

Regarding claim 1, Noguchi teaches an electro-optical element (¶ 76, line 1),comprising a substrate ((¶ 76, line 1-2) and at least one electro-optical structure which comprises an active layer with at least one organic electro-optical material (¶ 76, line 1-3), the substrate having at least one antireflection coating (¶ 93, line 1-3),with at least one layer (Table 1, columns 1-3) (*examiner note: prior art teaches 6-7 layer antireflection film*; Noguchi further teaches wherein the reflectance is reduced over the entire visible region (¶ 11)

Noguchi is silent regarding wherein the antireflection coating layer has a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of {i) minimal for light beams emerging from the

active layer at all angles for a wavelength in the spectral region of the emission spectrum, and (ii) at most 25% higher than the minimum, the integral reflectivity being the reflectivity which is integrated over all the emission angles of light beams which emerge from the active laver, at the boundary faces of the antireflection coating.

In the same field of endeavor of antireflection films and optical devices, Haaland teaches wherein the antireflection coating layer has a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of (i) minimal for light beams emerging from the active layer at all angles for a wavelength in the spectral region of the emission spectrum and (ii) at most 25% higher than the minimum (Page 3, lines 20-25) (*Examiner note: prior art teaches that the value F, perceived reflectance, is used to calculate thicknesses in consideration of material and the index of refraction of that material, prior art further the layers are configured such that the reflectance is within 25 percent of the minimum value)* in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer.

Haaland et al. does not explicitly teach the integral reflectivity being the reflectivity which is integrated over all the emission angles of light beams which emerge from the active laver, at the boundary faces of the antireflection coating. Rather he teaches on (page 3, lines 20-35) and (page 11, lines 20-25) that minimum reflectivity is calculated over a wide range of viewing conditions and interfaces.

Therefore one of ordinary skill in the art at the time of the invention could modify he device of Noguchi wherein the antireflection coating layer has a thickness and a

refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of {i) minimal for light beams emerging from the active layer at all angles for a wavelength in the spectral region of the emission spectrum, and (ii) at most 25% higher than the minimum, the integral reflectivity being the reflectivity which is integrated over all the emission angles of light beams which emerge from the active layer, at the boundary faces of the antireflection coating in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer as taught by Haaland et al.

Regarding claim 2, Noguchi is silent regarding wherein the thickness of the coating and the refractive index of the antireflection coating are selected such that the integral of the reflectivity of the antireflection coating is one of (i) minimal and (ii) deviates from the minimum value by 25% at most.

In the same field of endeavor of antireflection films and optical devices, Haaland teaches the antireflection coating layer wherein the thickness of the coating and the refractive index of the antireflection coating are selected such that the integral of the reflectivity of the antireflection coating is one of (i) minimal and (ii) deviates from the minimum value by 25% at most (Page 3, lines 20-30 and page 11, lines 20-25) (*Examiner note: prior art teaches that the value F, perceived reflectance, is used to calculate thicknesses in consideration of material and the index of refraction of that material, prior art further teaches the layers are configured such that the reflectance is within 25 percent of the minimum value)* in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer.

Therefore one of ordinary skill in the art at the time of the invention could modify he device of Noguchi wherein the thickness of the coating and the refractive index of the antireflection coating are selected such that the integral of the reflectivity of the antireflection coating is one of (i) minimal and (ii) deviates from the minimum value by 25% at most. in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer as taught by Haaland et al.

Examiner note: the applicant is attempting to uses integrals with unknown values or ranges to set forth claimed limitations within the device. These integrals do not set forth any structural limitations beyond which has already been given and the only requirement is that the layers are within 25% of the minimum calculated value. As evidence by cited prior art, antireflection is founded in such a manner, so the integrals and equations given in this claim are considered product by process, as the applicant is claiming a product, which has been shown by a prior art, with a process which resolves essentially the same issues.

Regarding claim 3 and 5, Noguchi is silent regarding wherein the antireflection coating layer has a thickness and a refractive index for which the reflectivity, which is integrated over all the angles of the light beams emerging from the active layer and the wavelengths of the spectral region of the emitted radiation and which is weighted with the spectral intensity distribution, at the boundary faces of the antireflection coating (claim 3) and the spectral sensitivity of the eyes (claim 5) is one of (i) minimal [[or]] and (ii) at most 25 percent, higher than the minimum.

In the same field of endeavor of antireflection films and optical devices, Haaland teaches wherein the antireflection coating layer has a thickness and a refractive index for which the reflectivity, which is integrated over all the angles of the light beams emerging from the active layer and the wavelengths of the spectral region of the emitted radiation and which is weighted with the spectral intensity distribution, at the boundary faces of the antireflection coating (page 3, lines 20-30) and the spectral sensitivity of the eyes (Page 3, lines 20-35) is one of (i) minimal and (ii) deviates from the minimum value by 25% at most (Page 3, lines 20-30) (*Examiner note: prior art teaches that the value F, perceived reflectance, is used to calculate thicknesses in consideration of material and the index of refraction of that material, prior art further the layers are configured such that the reflectance is within 25 percent of the minimum value)* in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer.

Therefore one of ordinary skill in the art at the time of the invention could modify the device of Noguchi wherein the antireflection coating layer has a thickness and a refractive index for which the reflectivity, which is integrated over all the angles of the light beams emerging from the active layer and the wavelengths of the spectral region of the emitted radiation and which is weighted with the spectral intensity distribution, at the boundary faces of the antireflection coating and the spectral sensitivity of the eyes is one of (i) minimal [[or]] and (ii) at most 25 percent, higher than the minimum in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer as taught by Haaland et al.

Regarding claims 4 and 6, These claims are considered product by process, Noguchi as modified by Haaland teaches claim 1 and that the antireflection coating is used to minimize the perceived reflectance from the viewer. The applicant is attempting to use integrals with unknown values or ranges to set forth claimed limitations within the device. These integrals do not set forth any structural limitations beyond which has already been given and the only requirement is that the layers are within 25% of the minimum calculated value. As evidence by cited prior art, antireflection is founded in such a manner, so the integrals and equations given in this claim are considered product by process, as the applicant is claiming a product, which has been shown by a prior art, with a process which resolves essentially the same issues , thus is considered a product by process claim.

Regarding claim 7, Noguchi teaches wherein the at least one electro-optical structure (¶ 76, line 1) comprises a first conductive layer (¶ 76, line 1-3) and a second conductive layer (¶ 76, line 1-3) between which an active layer ((¶ 76, line 1-4), which comprises the at least one organic, electro-optical material ((¶ 76, line 1-4), is arranged.

Regarding claim 8, Noguchi teaches wherein at least one of the first and second conductive layers is at least partially transparent (¶ 76, line 1-3)

Regarding claim 9, Noguchi teaches characterized in that the substrate comprises glass. (¶ 76, line 1-4)

Regarding claim 10, Noguchi teaches, characterized in that the at least one antireflection coating (8, 10) comprises a plurality of layers.

Regarding claim 11, Noguchi teaches, wherein the layers (Table 1, columns 1-3) have different refractive indices.

Regarding claim 12, Noguchi teaches wherein the antireflection coating has three layers (Table 1, columns 1-3)

Regarding claim 13 and 15, Noguchi is silent wherein the layers are arranged, starting from the substrate in a layer sequence of a layer with a medium refractive index /layer with a high refractive index /layer with a low refractive index (claim 13); wherein the antireflection coating has at least one of the following materials: titanium oxide, tantalum oxide, niobium oxide, hafnium oxide, aluminum oxide, silicon oxide, magnesium nitride (claim 16).

In the same field of endeavor of coatings for optical devices, Haaland et al teaches wherein the layers are arranged, starting from the substrate in a layer sequence of a layer with a medium refractive index (PrO, 1.92) /layer with a high refractive index(TiO, 2.06) /layer with a low refractive index (MgF, 1.38) (Page 5, lines 30-35); wherein the antireflection coating has at least one of the following materials: titanium oxide, tantalum oxide, niobium oxide, hafnium oxide, aluminum oxide, silicon oxide, magnesium nitride(Page 5, lines 30-35) in order to provide a device that can significantly reduce the amount of reflected light that can be perceived by the human visual system over all relevant angles and wavelengths (Page 2, lines 25-28).

Therefore one of ordinary skill in the art at the time of the invention could modify the electro-optical device of Noguchi wherein the layers are arranged, starting from the substrate in a layer sequence of a layer with a medium refractive index /layer with a

high refractive index /layer with a low refractive index; wherein the antireflection coating has at least one of the following materials: titanium oxide, tantalum oxide, niobium oxide, hafnium oxide, aluminum oxide, silicon oxide, magnesium nitride in order to provide a device that can significantly reduce the amount of reflected light that can be perceived by the human visual system over all relevant angles and wavelengths as taught by Haaland et al.

Regarding claim 16, Noguchi teaches wherein the at least one antireflection coating (Table 1) is arranged on the side of the substrate (2) on which the at least one electro-optical structure (¶ 76, line 1-4) is applied.

Regarding claim 25, Noguchi teaches a method for manufacturing an organic, electro-optical element (¶76, line 1-2), comprising the steps: coating at least one side of a substrate ((¶ 76, line 1-2) with an antireflection coating ((¶ 93, line 1-3) and applying at least one electro-optical structure (¶ 76, line 1-4), which comprises at least one organic, electro-optical material (¶ 76, line 1-4) where the substrate is coated with an antireflection coating (8, 10)

Noguchi is silent regarding wherein at least one layer with a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating for light beams emerging for all angles in the active layer and for a wavelength in the spectral range of the emitted light is one of (i) minimal and (ii) at most 25 percent higher than the minimum, the integral reflectivity being the reflectivity which is integrated over all the emission angles of light beams which emerge from the active layer, at the boundary faces of the antireflection coating.

In the same field of endeavor of antireflection films and optical devices, Haaland teaches wherein the antireflection coating layer has a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of (i) minimal for light beams emerging from the active layer at all angles for a wavelength in the spectral region of the emission spectrum and (ii) at most 25% higher than the minimum (Page 3, lines 20-25 and Page 11, lines 20-25) (*Examiner note: prior art teaches that the value F, perceived reflectance, is used to calculate thicknesses in consideration of material and the index of refraction of that material, prior art further the layers are configured such that the reflectance is within 25 percent of the minimum value)* in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer.

Haaland et al. does not explicitly teach the integral reflectivity being the reflectivity which is integrated over all the emission angles of light beams which emerge from the active laver, at the boundary faces of the antireflection coating. Rather he teaches on (page 3, lines 20-35) and (page 11, lines 20-25) that minimum reflectivity is calculated over a wide range of viewing conditions and interfaces.

Therefore one of ordinary skill in the art at the time of the invention could modify he device of Noguchi wherein the antireflection coating layer has a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of {i) minimal for light beams emerging from the active layer at all angles for a wavelength in the spectral region of the emission spectrum, and (ii) at most 25% higher than the minimum, the integral reflectivity being the reflectivity which is

integrated over all the emission angles of light beams which emerge from the active layer, at the boundary faces of the antireflection coating in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer as taught by Haaland et al.

Regarding claim 26, Noguchi teaches wherein the step of applying at least one electro-optical structure ((¶ 76, line 1-4) comprises the steps: applying a first conductive layer (¶ 76, line 1-4)applying at least one active layer (¶ 76, line 1-4) which comprises the at least one organic, electro-optical material (¶ 76, line 1-4)and applying a second conductive layer (¶ 76)

Regarding claim 27, Noguchi teaches wherein the step of coating at least one side of a substrate with an antireflection coating (¶ 93, line 1-3)comprises the step of coating with an antireflection coating which has a plurality of layers (Table 1, col.1-3).

Regarding claim 28 and 40, Noguchi is silent regarding wherein the step of coating at least one side of a substrate with an antireflection coating comprises the steps: applying a layer with a medium refractive index applying a layer with a high refractive index and applying a layer with a low refractive index (claim 28); wherein the thickness and the refractive index of the layer for which the integral reflectivity at the boundary faces of the antireflection coating (10) for all the light beams emerging for all angles in the active layer and for a wavelength in the spectral region of the emitted light is one of (i) minimal and (ii) at most 25 percent higher than the minimum, are calculated (claim 40).

In the same field of endeavor of coatings for optical devices, Haaland et al teaches wherein the step of coating at least one side of a substrate with an antireflection coating comprises the steps: applying a layer with a layer with a medium refractive index (PrO, 1.92) / and applying a layer with a high refractive index(TiO, 2.06) / and applying layer with a low refractive index (MgF, 1.38) (Page 5, lines 30-35); wherein the antireflection coating layer has a thickness and a refractive index for which the integral reflectivity at the boundary faces of the antireflection coating is one of (i) minimal for light beams emerging from the active layer at all angles for a wavelength in the spectral region of the emission spectrum and (ii) at most 25% higher than the minimum (Page 3, lines 20-25 and Page 11, lines 20-25) (*Examiner note: prior art teaches that the value F, perceived reflectance, is used to calculate thicknesses in consideration of material and the index of refraction of that material, prior art further the layers are configured such that the reflectance is within 25 percent of the minimum value)* in order to improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer..

Therefore one of ordinary skill in the art at the time of the invention could modify he device of Noguchi wherein the step of coating at least one side of a substrate with an antireflection coating comprises the steps: applying a layer with a medium refractive index applying a layer with a high refractive index and applying a layer with a low refractive index ; wherein the thickness and the refractive index of the layer for which the integral reflectivity at the boundary faces of the antireflection coating for all the light beams emerging for all angles in the active layer and for a wavelength in the spectral

region of the emitted light is one of (i) minimal and (ii) at most 25 percent higher than the minimum, are calculated in order to provide a device that can significantly reduce the amount of reflected light that can be perceived by the human visual system over all relevant angles and wavelengths, but also improve the perceived colors coming from an optical device thus allowing for improved image quality for the viewer as taught by Haaland et al.

Regarding claim 33, Noguchi wherein the antireflection coating (¶ 93, lines 1-3) is applied to a structured side (¶ 76) of the substrate (¶ 76)

Regarding claim 35, Noguchi wherein the antireflection coating (¶ 93, lines 1-3) a side of the substrate which is provided with regular structures side (¶ 76) of the substrate (¶ 76), Noguchi teaches an OLED to which the antireflection layer is applied. Even though he does not mention a plurality of structures one of ordinary skill in the art could apply the antireflection coating of Noguchi across a plurality of OLED devices in order to enhance image quality.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647) as applied to claims 1, 13,15, 25, 28 and 40, and in further view Yamauchi (US 2004/0160165 A1).

Noguchi as modified by Haaland et al. teaches the device set forth above (see rejection claim 1). Noguchi teaches the antireflection coating (Table 1, columns 1-3) has at least two layers (Table 1, columns 1-3), and one of the conductive layers (¶ 76 and (¶ 93, lines 1-3)) is adjacent to the antireflection coating (¶ 93, lines 1-3).

Noguchi as modified by Haaland et al. is silent regarding wherein the conductive layer has a refractive index which is less than the refractive indices of the at least two layers of the antireflection coating.

In the same field of endeavor of optical coatings, Yamamuchi teaches (Figure 19) wherein the conductive layer (215) has a refractive index which is less than the refractive indices of the at of the antireflection coating (230) (¶ 104) (*prior art teaches that the anode's index of refraction can be made to be less that index as light-emitting layer* is about 1.7 see ¶101, lines 1) in order to improve the output efficiency of the transmitted light. Yamamuchi does not explicitly teach that the two layers of 230 have indices of refraction greater than the anode. Prior art teaches that the 230 is made of an output layer 230 and reflecting layer 213 which act as the reflecting film and when combined have index of reflection equal to or greater than that of the light-emitting layer).

Therefore one of ordinary skill in the art could further modify the electro-optical device of Noguchi wherein the conductive layer has a refractive index which is less than the refractive indices of the at least two layers of the antireflection coating in order to improve the output efficiency of the transmitted light as taught by Yamamuchi.

9. Claims 17-18 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647) as applied to claims 1, 13,15, 25, 28 and 40, and in further view of Duffy et al. (US 2004/0134233 A1)

Regarding claims 17-18 and 36-38, Noguchi as modified by Haaland et al. teaches the device set forth above (see rejections 1 and 25). Noguchi as modified by Haaland et al. is silent regarding wherein at least one adaptation coating is arranged between the antireflection coating and electro-optical structure (claim 17) ; wherein at least one adaptation coating is applied to the antireflection coating (Claim 36); wherein at least one antireflection coating on the side of the substrate which is opposite the side on which the at least one electro-optical structure is arranged (claim 18 and 37) ;wherein antireflection coatings are applied to each side of the substrate (claim 38).

In the same field of endeavor of optical coatings, Duffy et al. teaches (Figures 5-6) wherein at least one adaptation coating (86) (¶ 36 lines 15-20) (*Examiner note: prior art teaches pressure sensitive adhesive to add with index matching with AR film)* is arranged between the antireflection coating (78) and electro-optical structure (84) ; wherein at least one adaptation coating (86) is applied to the antireflection coating (78) (¶ 36 lines 15-20) (*Examiner note: prior art teaches pressure sensitive adhesive to add with index matching with AR film)* ;wherein at least one antireflection coating on the side (78) of the substrate (24) which is opposite the side on which the at least one electro-optical structure (84) is arranged; wherein antireflection coatings (22, 78) are applied to each side of the substrate (24) (¶ 11, lines 5-10 and 13-16) in order to provide a device with enhanced the transmission of light through the device as well as improved clarity in the image (¶ 11, lines 19-21 and ¶10).

Therefore one of ordinary skill in the art could further modify the electro-optical device of Noguchi wherein at least one adaptation coating is arranged between the

antireflection coating and electro-optical structure ; wherein at least one antireflection coating on the side of the substrate which is opposite the side on which the at least one electro-optical structure is arranged ; wherein antireflection coatings are applied to each side of the substrate in order to provide a device with enhanced the transmission of light through the device as well as improved clarity in the image as taught by Duffy et al.

10. Claims 20, and 24, 29, 31-32, 34 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647) as applied to claims 1, 13,15, 28 and 40, and in further view of Ikegaya et al. (US 2001/0049005 A1).

Regarding claims 20 and 22-24, Noguchi as modified by Haaland et al. teaches the device set forth above (see rejection claim 1). Noguchi as modified by Haaland et al. is silent regarding wherein the antireflection coating has light-scattering structures (claim 20); defined by a structured boundary face with light-scattering structures between the antireflection coating and substrate (claim 22) or defined by an additional layer with light-scattering structures (claim 23)and wherein the additional coating has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is arranged on the substrate (claim 24).

In the same field of endeavor, Ikegaya et al. teaches (Figures 1- 3B) wherein the antireflection coating (10) has light-scattering structures (18) (¶46 lines 1-2); defined by a structured boundary face with light-scattering structures (18) between the antireflection coating(10) and substrate (20) or defined by an additional layer (27) with

light-scattering structures (18a))and wherein the additional coating 927) has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is arranged on the substrate (20) (¶68 and 74, lines 1-3)) *(Prior art teaches that 26 and 27 are made of the same material with an index of refraction $\leq$ of the substrate)* in order to improve contrast and improve the quality of the display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the electro-optical Noguchi wherein the antireflection coating has light-scattering structures defined by a structured boundary face with light-scattering structures between the antireflection coating and substrate or defined by an additional layer with light-scattering structures and wherein the additional coating has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is arranged on the substrate *)* in order to improve contrast and improve the quality of the display as taught by Ikegaya et al.

Regarding claim 29, 31-32, 34, and 39, Noguchi as modified by Haaland et al. teaches the device set forth above (see rejection claim 25). Noguchi as modified by Haaland et al. is silent regarding wherein the substrate is coated with an antireflection coating which has light-scattering structures (claim 29) ;wherein an additional layer with light-scattering structures is applied (claim 31) ;wherein the additional layer has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is applied to the substrate (claim 32); wherein the antireflection coating is applied to a roughened side of the substrate (claim 34); wherein the step of coating at least one side of a substrate with an antireflection coating is carried out with

one of (i) vacuum coating, (ii) chemical deposition from the gas phase (CVD), (iii) thermally or plasma-enhanced chemical vapor deposition (PECVD) or plasma impulse chemical vapor deposition (PICVD), and (iv) by means of Sol-gel coating, immersion, spray or centrifugal coating (Claim 39)

In the same field of endeavor, Ikegaya et al. teaches (Figures 1- 3B) wherein the substrate (20) is coated with an antireflection coating (10) which has light-scattering structures (18) (¶46 lines 1-2); wherein an additional layer (26) with light-scattering structures is applied ((¶67) ;wherein the additional layer has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is applied to the substrate ((¶68); wherein the antireflection coating (10) (Figure 2) is applied to a roughened side (18) of the substrate (20); wherein the step of coating at least one side of a substrate (20) with an antireflection coating (10) is carried out with one of (i) vacuum coating, (ii) chemical deposition from the gas phase (CVD), (iii) thermally or plasma-enhanced chemical vapor deposition (PECVD) or plasma impulse chemical vapor deposition ((¶53) (prior art teaches sol-gel process) in order to improve contrast and improve the quality of the display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the electro-optical Noguchi wherein the substrate is coated with an antireflection coating which has light-scattering structures; wherein an additional layer with light-scattering structures is applied and wherein the additional layer has a refractive index which corresponds essentially to the refractive index of the substrate, and the additional layer is applied to the substrate; wherein the antireflection

coating is applied to a roughened side of the substrate; wherein the step of coating at least one side of a substrate with an antireflection coating is carried out with one of (i) vacuum coating, (ii) chemical deposition from the gas phase (CVD), (iii) thermally or plasma-enhanced chemical vapor deposition (PECVD) or plasma impulse chemical vapor deposition (PICVD), and (iv) by means of Sol-gel coating, immersion, spray or centrifugal coating in order to improve contrast and improve the quality of the display at taught by Ikegaya et al.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647) as applied to claims 1, 13,15, 25, 28 and 40, view of Ikegaya et al. (US 2001/0049005 A1) as applied to claims 20, and 22-24 and in further view of Obayashi et al. (US 2003/0120008 A1).

Noguchi as modified by Haaland et al. and Ikegaya et al. teaches the device set forth above (see rejection claims 1 and 20). Noguchi as modified by Haaland et al. and Ikegaya et al. is silent regarding wherein the light-scattering structures comprise at least one of crystals, particles and occlusions in the antireflection coating .

In the same field of endeavor of antireflections coatings, Obayashi teaches wherein the light-scattering structures comprise at least one of crystals, particles and occlusions in the antireflection coating (¶248, lines 5-13) in order to improve contrast and the overall quality of the displayed image.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the electro-optical Noguchi wherein the light-scattering structures comprise at least one of crystals, particles and occlusions in the

antireflection coating in order to improve contrast and the overall quality of the displayed image as taught by Obayashi et al.

12. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US2004/0051950 A1) in view of Haaland et al. (WO 01/09647) as applied to claims 1, 13,15, 25, 28 and 40, and in further view of Obayashi et al. (US 2003/0120008 A1).

Noguchi as modified by Haaland et al. and Ikegaya et al. teaches the device set forth above (see rejection claim 25). Noguchi as modified by Haaland et al. is silent regarding wherein an antireflection coating is applied which contains at least one of crystals, particles and occlusions which have a refractive index or orientation which differs from that of the surrounding material.

In the same field of endeavor of antireflections coatings, Obayashi teaches wherein an antireflection coating (¶248, lines 5-13) is applied which contains at least one of crystals, particles and occlusions which have a refractive index or orientation which differs from that of the surrounding material. (¶249, lines 5-13) *(Prior art discloses a fluorine type coating with silica or TiO particles)* in order to improve contrast and the overall quality of the displayed image.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the electro-optical Noguchi wherein an antireflection coating is applied which contains at least one of crystals, particles and occlusions which have a refractive index or orientation which differs from that of the surrounding material in order to improve contrast and the overall quality of the displayed image as taught by Obayashi et al.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracie Green whose telephone number is (571)270-3104. The examiner can normally be reached on Mon-Thurs 7:00am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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